

LCMR: *Not just an* additional duty

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Since fielding in 2003, the AN/TPQ-48 Lightweight Countermortar Radar has provided the joint force with an invaluable 6,400 mil countermortar acquisition capability that is essential in counter-insurgency operations. In an operating environment where units, sometimes as small as platoons, operate from remote combat outposts and forward operating bases, the LCMR is often the only counterfire target acquisition system available. Unlike its radar cousins, the Q-36 or Q-37 Firefinder radars, the LCMR was not fielded with an LCMR operator military occupational skill or modified table of organization and equipment section.

According to *Field Manual 3-09.23 Tactics, Techniques and Procedures for the Modular Fires Battalion* Draft Version 2 dated May 8, 2009, "Target acquisition platoons are organized with a platoon headquarters, a Q-36 radar section and Q-48 lightweight countermortar radars. In addition, the heavy brigade combat team and Stryker brigade combat team fires battalion have a Q-37 radar section." Note the lack of an allocated section for the LCMR. This has led to considerable shortcomings in proper emplacement, operation and maintenance that have reduced the LCMR's overall effectiveness.

Manning burden. The lack of dedicated personnel is exasperated further by the exceptional requirement for LCMR coverage in Afghanistan. Even if the Army had decided to create an LCMR operator military occupational specialty, the current demand far exceeds the brigade combat team modified table of organization and equipment allocation of four LCMRs. For example, Combined Joint Task Force 82 operates more than 50 LCMRs throughout Regional Command-East. The decision to field the LCMR without a modified table of organization and equipment section or MOS has placed the manning burden onto the brigade combat team. While already stretched thin, brigade combat teams now must generate *ad hoc* LCMR sections from non-radar and more often non-artillery personnel.

While it is unrealistic to consider



CW4 Dallas Whitney (left) and MAJ Ben Luper, both of Combined Joint Task Force-82 Joint Fires Cell, stand next to an AN/TPQ-48v2 Lightweight Countermortar Radar at an undisclosed location in January. (Photo by Capt. Bernie King, U.S. Air Force)

manning the LCMR with 13R Radar Operators, the LCMR does require fully trained and certified operators and dedicated sections to employ, operate and maintain the radar effectively. An unintended consequence of the Army's decision not to provide the LCMR with an modified table of organization and equipment section or MOS personnel is the perception that the LCMR requires little more than the operator to power-up and monitor the radar passively. By treating the LCMR as an additional duty, much like conducting dining facility headcount, and employing rotating or part-time sections, the LCMR's ability to provide a counterfire acquisition and force protection capability is reduced significantly if not lost altogether.

The LCMR requires trained, certified and permanently manned sections to achieve its full operating capability, just as any weapon system or command and control application. The lack of expertise and dedicated manpower has created a habit and, more often, a necessity for operators and fires staffs to forward problems and issues — many of which entail 10- to 20-

level maintenance, employment and basic operator-level troubleshooting directly to civilian field service representatives.

Frequent issues. The most common errors associated with the employing the LCMR stem from the lack of adequate planning and understanding of the LCMR's capabilities and limitations. Operators frequently assume that because the LCMR has a 6,400 mil acquisition capability, location considerations are minimal. Leaders must take the LCMR's operational requirements into account in their forward operating base/combat outpost defensive plans with the same emphasis provided to the Firefinder radars, howitzers, mortars and direct fire weapons systems. Placing the LCMR on the highest point or building on a forward operating base often surrounded by numerous radio antennae is not always the optimal location for the radar.

Detailed assessment. The target acquisition platoon leader, fire support officer, fire support NCO and S2 intelligence officer must conduct a detailed assessment of enemy indirect fire capabilities and template or historic firing locations. By understanding

the enemy's indirect fire system's ballistic and trajectory characteristics and tactics, techniques and procedures, planners can apply this data to calculate the optimal placement for the LCMR to acquire enemy indirect fire. The pivotal factor of whether or not the radar acquires the projectile is the amount of time the projectile is within the radar search beam. The enemy indirect fire time of flight must not be confused with the LCMR's track time requirements.

Applying proper employment planning fundamentals in conjunction with current intelligence assessments is only the first step in achieving successful LCMR acquisitions. By estimating the trajectory's maximum ordinate and the round's entry point into the radar beams, planners can calculate the required radar track time. This calculation results in an optimal "goose egg" location for the radar. The challenge in Afghanistan, as well as any environment that operates from company-sized forward operating bases, is the goose egg may fall outside the physical confines of the forward operating base. However, this does not alleviate the requirement or value of performing this calculation.

Essential considerations. Accurate radar location and boresight azimuth of the radar are essential for accurate enemy indirect fire acquisitions. If the radar does not have an accurate location and orientation direction, its ability to calculate the acquisition grid location within 100 meters is limited tremendously. For example, during a polar fire mission, if a fire direction center has an inaccurate grid for a forward observer and the forward observer provides an inaccurate azimuth to the target, the computed target location is inherently inaccurate. The use of survey teams for positioning and emplacement is preferred, however at a minimum the use of an AN/PSN-13A Defense Advanced Global Positioning System Receiver and a precision mapping software tool, such as Falcon View, is sufficient. Unlike indirect fire systems, a five meter error in radar location does not translate into a point of origin location error of five meters. An acquisition at a range of five kilometers with an LCMR with a five

meter positioning to bore-sighting error will produce a 250 meter target location error.

Once the LCMR is located and emplaced properly, the radar requires a proficient operator to initialize the LCMR radar software, operate Falcon View, the geographic translator and the advanced communication service applications, input the mission planning data and establish interoperability with the LCMR Remote. Additionally the operator must initialize the Personal Data Assistant, Advanced Field Artillery Tactical Data System and Counter-Rockets, Artillery and Mortar systems, as required. Operators must understand the system's operational capabilities, have proficiency in uploading mission data into the system's computer, maintain proper monitoring of the systems clutter display and acquisition tracks and establish interoperability with others systems. While this may seem like a lot, the LCMR radar software is not overly difficult to operate. Much like any computer application, training, repetition and experience are essential.

Daily operator maintenance is also essential for optimal performance. The LCMR requires operators to conduct daily preventive maintenance checks and services same as any other item of equipment. Daily maintenance includes, but is not limited to, checking the cylinder for proper power connection, cleaning the cover and the 24 antenna columns, checking antenna column connections, properly powering down the radar and Miltope computer system for a short periods of time, re-leveling the radar and re-orienting the radar onto its bore sighting point. Operational readiness reporting in Afghanistan shows that units that conduct these daily maintenance activities have better operational readiness rates and significantly more accurate acquisitions.

Deploying units must identify, assign, train and certify personnel on the LCMR before deployment. Setting up the radar on an observation post during live-fire exercises is an excellent way for operators to gain experience and validate their training on the LCMR. Once deployed,

the assigned personnel must stay on the systems and receive further sustainment training throughout the deployment. Understandably, the need to rotate personnel may arise. However, leaders must understand the level of training and experience required to achieve full operating capability of the LCMR.

As artilleryman, we are duty bound by the mission of field artillery, "To integrate all fire support assets into combined arms operations." The Q-48 LCMR is one of those assets. For a system that will provide you with an eight-digit grid location within 100 meters from where the enemy is engaging you with lethal indirect fires, it is surprising to see the marginal effort across all maneuver, fires and effects branches that is spent toward the LCMR's employment and operation. While it is unrealistic, given the operating environment, that artillerymen are present everywhere an LCMR is employed, it is not outside our capacity to provide oversight and leadership for its employment, operation and maintenance.

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